



**METHODS FOR CONTROLLING POSITIONS OF THE GUIDED MODES OF
THE PHOTONIC CRYSTAL WAVEGUIDES**

Abstract of the Disclosure

5 The invention is directed to different methods for controlling the positions
of the guided modes of the photonic crystal waveguides. Methods based on both
rearrangement of the holes and changing the size of the holes are presented. We
have observed and explained the appearance of acceptor-type modes and the
donor-type waveguides. The ability to tune frequencies of the guided modes
10 within a frequency bandgap is necessary in order to achieve efficient guiding of
light within a waveguide (reduced lateral and vertical waveguide losses) as well
as to match frequencies of eigen modes of different photonic crystal based
devices in order to have good coupling between them.

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